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AMSAT NEWS SERVICE
ANS-028

The AMSAT News Service bulletins are a free, weekly news and information service of AMSAT North America, The Radio Amateur Satellite Corporation. ANS publishes news related to Amateur Radio in Space including reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

The news feed on http://www.amsat.org publishes news of Amateur Radio in Space as soon as our volunteers can post it.

Please send any amateur satellite news or reports to:
ans-editor at amsat.org.

You can sign up for free e-mail delivery of the AMSAT News Service Bulletins via the ANS List; to join this list see:
http://www.amsat.org/mailman/listinfo/ans

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SB SAT @ AMSAT $ANS-028.01
ANS-028 AMSAT News Service Weekly Bulletins

AMSAT News Service Bulletin 028.01
 From AMSAT HQ KENSINGTON, MD.
DATE January 28, 2018
To All RADIO AMATEURS
BID: $ANS-028.01

AO-92 Commissioned, Open for Amateur Use

On the 03:25 UTC pass on January 26, 2018, AMSAT Vice President – Engineering Jerry Buxton, N0JY, announced that AO-92 had been commissioned and formally turned the satellite over to AMSAT Operations. AMSAT Vice President – Operations Drew Glasbrenner, KO4MA, then declared that AO-92 was now open for amateur use.

Initially, the U/v FM transponder will be open continuously for a period of one week. After the first week, operations will be scheduled between the U/v FM transponder, L-Band Downshifter, Virginia Tech Camera, and the University of Iowa's High Energy Radiation CubeSat Instrument (HERCI).

Schedule updates will appear in the AMSAT News Service Weekly Bulletins and will also be posted to the AMSAT-BB, AMSAT's Twitter account (@AMSAT), the AMSAT North America Facebook group, and the AMSAT website at https://www.amsat.org/satellite-schedules/

AO-92 was launched on the PSLV-C40 mission from Satish Dhawan Space Centre in Sriharikota, India on January 12, 2018. For the past two weeks, the AMSAT Engineering and Operations teams have been testing the various modes and experiments on board. Testing has shown that both the U/v FM transponder and L-Band Downshifter work very well. The Virginia Tech camera has returned stunning photos and data from HERCI has been successfully downlinked.

AMSAT thanks the 178 stations worldwide that have used FoxTelem to collect telemetry and experiment data from AO-92 during the commissioning process. The collection of this data is crucial to the missions of AMSAT's Fox-1 satellites. Please continue to collect data from AO-85, AO-91, and AO-92.

RADIO PROGRAMMING CHART
Fox-1D Doppler Shift Correction

Memory 1 (AOS) - TX 435.340 MHz (67.0 Hz Tone), RX 145.880 MHz
Memory 2 (Rise) - TX 435.345 MHz (67.0 Hz Tone), RX 145.880 MHz
Memory 3 (TCA) - TX 435.350 MHz (67.0 Hz Tone), RX 145.880 MHz
Memory 4 (Descend) - TX 435.355 MHz (67.0 Hz Tone), RX 145.880 MHz
Memory 5 (LOS) - TX 435.360 MHz (67.0 Hz Tone), RX 145.880 MHz

The L-band experiment will use 1267.350 MHz uplink with 145.880 MHz downlink. UHF and L-band uplink operation are set by the command stations; the operating schedule will be posted.

[ANS thanks AMSAT Vice-President Engineering, Jerry Buxton, NØJY, AMSAT Vice President Operatings Drew Glasbrenner, KO4MA, and AMSAT Executive Vice President Paul Stoetzer, N8HM for the above information]

AMSAT Membership Deal and Getting Started

AMSAT membership supports the organization and construction of new satellites. Right now, we are offering a free PDF copy of our Getting Started with Amateur Satellites with every new on-line membership. This is -the- primer for getting on the sats, and is updated every year. See https://www.amsat.org/product-category/amsat-membership/

AMSAT also sells both the popular Arrow Antenna satellite models and the M2 LEOpack antennas. Sales also benefit AMSAT projects. https://www.amsat.org/product-category/hardware/

[ANS thanks AMSAT Office for the above information]

FoxTelem Version 1.06 Software Released

Chris, G0KLA, has released version 1.06 of FoxTelem on January 27. This release addresses several defects and instabilities in FoxTelem

version 1.05 and earlier. It also introduces a new Earth Plot that allows any telemetry value to be plotted as a heat map against a map of the earth. For more details about the Earth Plot and some example plots, you can read a quick tutorial posted at:
http://www.g0kla.com/workbench/2018-01-26.php

As always, let Chris know if you see any issues or log them on github at https://github.com/ac2cz/FoxTelem/issues

KEY CHANGES
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* EARTH PLOTS allow you to plot any telemetry value as a heat map
   on a map of the earth
* Allow graphs and telemetry results to be searched with UTC dates
   and for ranges of uptime/dates
* Allow stepping through the telemetry with up/down arrows
* Prevent hang when decoder starts if FCD returns an error
* Fixed bug where TLEs were not updated in the name is changed
   in the spacecraft settings window
* Fixed crashes introduced in 1.05 release
* Display all HERCI High Speed payloads when Raw Byte Payloads shown
* Fix bug where missing TLE disables spacecraft from being tracked
   at all
* Fixes bug where DDE connection to SatPC32 fails with European
   decimal point format
* Add MPPT calibration values for Fox-1D
* Improved the RF signal measurements
* Improved the Find Signal algorithm
* Space graph labels more evenly
* Put the spacecraft tabs in FoxId order

And many other bug fixes. Full list of changes here:
https://github.com/ac2cz/FoxTelem/milestone/3?closed=1

[ANS thanks FoxTelem author Chris, G0KLA for the above information]

GOLF-TEE $15,000 Matching Funds President’s Challenge

In October 2017 AMSAT announced the GOLF (Greater Orbit, Larger Foot-print) program. The first project of the GOLF program is a technology demonstrator named GOLF-TEE (Technology Evaluation Environment). The design is a 3U CubeSat with deployable solar panels, ADAC (attitude determination and control), Software Defined Radio (SDR) Transponder, and a Vanderbilt University Low Energy Proton (LEP) experiment. Now is the time to begin work on the GOLF-TEE Project.

At the end of 2017, AMSAT has generous offers from two AMSAT Past Presidents for matching funds up to $15,000 for those that contribute to the GOLF-TEE campaign at:
https://www.paypal.com/cgi-bin/webscr?cmd=_s-xclick&hosted_button_id=STK27W4G9RMLC
(Shortened URL without linewrap:
http://tinyurl.com/ANS-028-PayPal-GOLF-Donation) between now and Feb-ruary 15th. Make your donation twice as valuable by taking advantage of this opportunity and contributing, and help AMSAT fund the launch of the next series of satellites of the GOLF program. There are also donate buttons for GOLF-TEE on the AMSAT website. Planning is for a launch in 2019.

Donations of $100 and $1,000 or more will be eligible for a special AMSAT GOLF premium. (Both premiums are currently being designed, so please be patient awaiting delivery.)
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AMSAT is a 501-(c)-(3) not-for-profit educational and scientific
organization of amateur radio operators whose purpose is to design,
construct, launch, and operate satellites in space and to provide
the support needed to encourage amateurs to utilize these resources.
Please consider a tax-deductible contribution to AMSAT to help under-
write the development and launch expenses of our GOLF satellite program.

Donors wishing to provide additional matching funds please contact
Joe Spier, K6WAO at k6wao(a)amsat.org.

(ANS thanks AMSAT-NA for the above information)

AMSAT Rover Award Up and Running - Already Up to #7 Awarded

On January 1, 2018, Bruce Paige, KK5DO, AMSAT Director Contests
and Awards announced the Rover Award. This award is granted to
stations who achieve a combined 25 points using any combination
of the defined criteria posted at:
https://www.amsat.org/amsat-rover-award/

Bruce says the AMSAT Rover Award is up to #7 - Congrats to Jose,
N7AGF, Rover Award #007.

Points can be earned for each grid square activated outside of your
home grid square using the FM, linear, and digital satellites. While
FM contacts count for 1 point each multiplier points are available
for contacts via the linear and digital satellites.

Additional points are available for photographs, publicity, social
media promotion, and AMSAT Journal articles. The options are numerous
so please refer to the Rover Award Website for all of the details.

Keep on roving!

[ANS thanks AMSAT Director Contests and Awards, Bruce Paige, KK5DO,
  for the above information]

D-Star ONE v.1.1 Phoenix Satellite Planned for Launch February 1

German Orbital Systems GmbH (GOS) and iSky Technology s.r.o. (iSky)
have announced a revival of the D-Star ONE satellite project to
replace their satellite lost as a result of a failed launch of the
Roscosmos Meteor-M No.2-1 meteorological mission on November 28, 2017.

GOS and iSky said their teams were actively working together during
the Christmas and New Year holidays, and are now happy to announce that
they we have completed the assembly and final checks of a replacement
satellite named D-Star ONE v.1.1 Phoenix satellite. The project is
Phoenix as symbol of the rebirth and revival of the project.

The launch of D-Star ONE v.1.1 Phoenix plans to launch on a Soyuz-2/Fregat
rocket for the launch from the Vostochny launch site on February 1, 2018.

D-Star repeater & beacon frequencies:
Uplink: 437.325MHz
Downlink: 435.525MHz
RF-Power: 800mW

Additional information will be posted at: http://www.d-star.one/ -and-
http://www.orbitalsystems.de/d-star-one-second-birth/?lang=en

Spaceflightinsider.com published an article about successful final testing on D-Star ONE: http://tinyurl.com/ANS-316-Spaceflightinsider www.spaceflightinsider.com)

[ANS thanks the D-Star ONE Team for the above information]

AO-91 QSO Two YLs Meet on the Air

Jeff Johns, WE4B, tweeted about the satellite contact via AO-91 his daughter Marissa, W4AQT, completed with Alyssa and her dad Charlie Azofeifa, TI2CDA.

Jeff said Alyssa had seen Marissa's QRZ page and it turns out they are both Harry Potter, Pete the Cat and Minecraft fans and she wanted to get Marissa's QSL card. Charlie and I looked for favorable passes and decided the 18:16z pass of AO-91 on 1/20/2018 would be our first attempt to have the girls make contact.

Marissa and dad Jeff went outside with radios and our Arrow antenna and waited for AO-91 to crest the horizon. As soon as they could hear the bird, W4AQT started calling TI2CDA. After a few calls, there was Alyssa with Charlie serving as the control op. The girls had a very sweet, quick QSO.

Jeff wrote, "Ham radio is supposed to be about learning and progressing the radio art but it's also about forming friendships, even if they are long distance friendships. I have no doubt that this will not be the last time that Marissa and Alyssa have a QSO and I am confident that Alyssa will soon get her own license as Marissa is almost ready to take her General exam. I was fortunate that my daughter became interested in amateur radio when she would go outside with me and listen to me talking to other hams with my Arrow antenna pointed at the sky. Now that she's licensed, it's allowed us to have some great father and daughter time together, as well as, providing her some excellent STEM education."

Jeff's post on the QRZ.com satellite forum and photos can be seen at: http://tinyurl.com/ANS-028-AO91-YL-QSO

[ANS thanks Jeff Johns, WE4B for the above information and congratulates Marissa, W4AQT on her satellite QSO]

Two More US Schools/Groups Move Into Phase 2 of ARISS Selections

January 13, 2018 – The ARISS-US team (Amateur Radio on the International Space Station) is pleased to announce that two more US schools or organizations have had their ARISS proposals selected for advancement to the next stage of planning for amateur radio contacts in 2018. These schools will take advantage of new scheduling opportunities to speak with International Space Station (ISS) crew members using the ARISS equipment.

The selected schools submitted proposals before the proposal window closed last November and join the 13 schools and groups chosen a few weeks ago. The two extra scheduling opportunities are special events thanks to ARISS's two major sponsors, the NASA Space Communications and Navigation group and the Center for the Advancement of Science in Space. The events that the schools' students will travel to are aerospace conferences where their ARISS radio contacts

will be a highlight open to conference attendees.

The schools and venues are:

+ Quest for Space/Quest Institute for Quality Education in San Jose, California, whose ARISS contact will be featured at the ISS R&D Conference, July 23-26 in San Francisco, California

+ Burns Science & Technical Charter School in Oak Hill, Florida, whose ARISS contact will be featured at the S.P.A.C.E. Conference, July 11-13 at NASA's Kennedy Space Center.

ARISS's primary goal is to engage young people in science, technology, engineering, and math (STEM) activities, and to involve them in activities related to space exploration, amateur radio, communications, and areas of associated study and career possibilities.

ABOUT ARISS
Amateur Radio on the International Space Station (ARISS) is a cooperative venture of the Radio Amateur Satellite Corporation (AMSAT), the American Radio Relay League (ARRL), Center for the Advancement of Science in Space (CASIS), the National Aeronautics and Space Administration (NASA) in the United States, and other international space agencies and international amateur radio organizations around the world. The primary goal of ARISS is to promote exploration of science, technology, engineering, and mathematics (STEM) topics by organizing scheduled contacts via amateur radio between crew members aboard the ISS and students in classrooms or informal education venues. With the help of experienced amateur radio volunteers from amateur radio clubs and coordination from the ARISS team, the ISS crew members speak directly with large group audiences in a variety of public forums such as school assemblies, science centers and museums, Scout camporees, jamborees and space camps, where students, teachers, parents, and communities learn about space, space technologies and Amateur Radio.

Find more information at www.ariss.org, www.amsat.organd www.arrl.org.

[ANS thanks ARISS for the above information]

ARISS APRS Packet Currently Non-Operational

ARISS NEWS RELEASE no. 18-02
January 26, 2018
David Jordan, AA4KN, ARISS PR

An unidentified anomaly involving the radio serving the ARISS APRS Packet System on board the ISS has led to the system not functioning.

A similar problem has occurred on other occasions and solutions that resolved the problem proved to be only temporary fixes. The system may return to service as it has in the past or it may have finally failed completely.

ARISS sees the delivery of the interoperable radio system as the true solution to securing our ARISS packet operation. Current target period for delivery and installation of the replacement system is Fall 2018.

In the meantime, ARISS continues to investigate the problem and seek opportunities to resolve the issue. The ARISS team knows many amateur radio operators really enjoy using the ARISS APRS

packet system, and thanks everyone for understanding the issues involved with not having it available.

[ANS thanks ARISS for the above information]

ARISS School Contact First for Cyprus

For the first time, students in Cyprus spoke live with an astronaut on the International Space Station orbiting the Earth on January 24. A video of this historic event can be viewed at: https://youtu.be/RJvDskycyj4?t=52m

The English School has established significant partnerships with the Cyprus Amateur Radio Society and the Kition Planetarium & Observatory who have been assisting throughout the long preparation period, while Cyta, PM-ICT Solutions with Polycom and Delta Electronics will offer their specialised technical assistance. Also, Alpha Cyprus is the media sponsor for the event. The English School thanks them all on behalf of the student “adventurers” who are thrilled by this great opportunity!

[ANS thanks ARISS for the above information]

PicSat Requests Amateur Radio Assistance to Capture/Upload Telemetry

Cubesat PicSat was launched on the same PSLV-C40 flight from India that delivered AO-92 to orbit. PicSat is a nano-satellite aimed at observing the transit of the young exoplanet Beta Pictoris b in front of its bright and equally young star Beta Pictoris, and at demonstrating an innovative technological concept to use optical fibres for astronomical observations from Space.

The cubesat contains an embedded FM transponder. It will be available when possible during the mission.

Frequency information:

Uplink FM	145.910 MHz	1750 Hz tone when in amateur mode
Downlink FM	435.525 MHz	9k6 BPSK AX25 Data and FM voice when in amateur mode

(Despite the documentation, PicSat beacons so far have been 1k2 BPSK.)

There is a 1k2 BPSK software modem in: http://uz7.ho.ua/modem_beta/other-versions.zip
A report posted by K4KDR advises to receive using upper sideband with the audio output centered on the middle of the passband.

A description of the telemetry and related information are available on https://picsat.obspm.fr/data/telemetries?locale=en.

This week the PicSat team requested amateur radio assistance to capture and upload telemetry packets from the satellite. Beacons received from all over the world are especially useful to monitor the status of satellite along its orbit (and not just when it is above our own station). Science data are obviously useful for the science mission. And all other packets, even when they do not look like much, can be of great importance! For example, we often receive satellite acknowledgements to our commands from ground station in France or Europe which are listening at the same time as us. It may look useless, but it is not. We regularly miss those packets our-

selves, so it is good to have other people receiving them and sending them to us.

There are three ways to send your data. The options for your upload will become available on your profile tab after registration at their website: https://picsat.obspm.fr/connexion?locale=en.

Full details of the packet uploading procedure are posted at: https://picsat.obspm.fr/contributing/send-packets?locale=en

+ Fast upload beacon: mainly intended as a way to directly upload a beacon by copy/paste when you receive, and to get an immediate overview of the satellite status. When you are a new user, this is also the only way you can upload a packet. Upload one beacon successfully, and you will have access to the other methods!

  This page accepts a hexadecimal string, like "0123456789ABCDEF" in which whitespaces and upper/lower case are ignored ("01 23 45 67 89 ab cd ef", or even something like "0 1 234 56789 aBc dEf" will be accepted). The hexadecimal string must represent the AX.25 packet (without flags), possibly KISS encapsulated (starting with "C0 00" and ending with "C0")

+ Upload data: this can be used to upload files containing multiple packets at once. The files are stored on our servers, and processed daily.

+ SiDS requests: This will be implemented in the near future.

PicSat shares a similar orbit with AO-91 since they were both deployed at approximately the same time. PicSat has been included in the 2 line Keplerian Elements distributions. On-line orbit predications for PicSat can be found at: https://picsat.obspm.fr/operations/orbital-map?locale=en.

PicSat news and information is presented in their on-line video: https://www.youtube.com/watch?v=BadAt92qHdU

[ANS thanks the PicSat Team for the above information]

AO-73 Operating Schedule Changes Announced

The FUNcube Operations Team says that AO73 will shortly be entering full sun light. Already the eclipse periods are only 11/12 minutes every orbit.Current predictions indicate that full sun will commence on February 6 and last through until March 14.

The FUNcube autonomous, on-board, scheduling system is based upons witching modes when entering and leaving eclipses, was not designed for this situation. The scheduling system will therefore not be suit able for operations over the next few months.

In line with the recently published plan, AO73 was switched to continuous amateur mode earlier commencing Thursday morning and will stay in this mode until Sunday night or Monday morning. We expect that this schedule will continue until mid April. The next full sun periods are then expected to return again in late August. Further info is available at https://funcube.org.uk/news/

[ANS thanks Graham G3VZV and the FUNcube Operations Team for the above information]

Volunteer Opportunity - Openings for News Service Rotating Editor

If you're open to volunteering to help AMSAT this is your chance!
We have openings for a few volunteers willing to help as an AMSAT
News Service editor.

Our editors work on a rotating schedule with each taking turns as
the current week's news editor. Using input received from members,
the amateur radio community, officers, plus our other editors your
job is to assemble the AMSAT News Service bulletin for your week.
(Template is provided to help you format the message.)

If you can help contact our Senior News Service Editor, Lee McLamb,
KT4TZ via his e-mail: kt4tz(a)amsat.org

(Ed. note: the need for at least one, hopefully many volunteer
  editors, is immediate. K9JKM will be retiring at the end of March
  with extensive travel plans, often out of reach of the internet.)

[ANS thanks the AMSAT News Service for the above information]

AMSAT Argentina LU1ESY-3 WSPR Balloon Flight Heading Out of Africa

AMSAT-LU (Argentina) advises that as part of LUSAT's 28th aniversary
celebrations, Ignacio, LU1ESY, launched a PicoBalloon on January 19
from Villa Gessell, Argentina. Floating at 12 KM height, it crossed
the South Atlantic Ocean, left South Africa, and last reports show
it some 500 km SSE from Madagascar, hopefully heading to Australia
and New Zealand.

It is transmitting as LU1ESY-3 on 14075.6 KHz WSPR, 25 mW, 25 gram
payload using a WB8ELK tracker. As of January 27, LU7AA reports that
the balloon has completed one orbit around the world.

The APRS track can be followed on aprs.fi:
https://aprs.fi/#!call=a%2FLU1ESY-3&timerange=604800&tail=604800
and also at http://lu7aa.org/wspr.asp

Pictures on http://amsat.org.ar/globo09.htm and
http://amsat.org.ar

Thanks to hams in Antartica, South Africa and Namibia for their WSPR
captures & upload to http://wsprnet.org .

[ANS thanks AMSAT Argentina for the above information]

OR4ESA Redu Ground Station Belgium on the Air Until February 6

Javier Roldan, EA1HEO, will be activating OR4ESA from the ESA Redu
Ground Station in Belgium from the 16th of January until the 6th of
February 2018. He is taking advantage of a visit to the site during
refurbishment of the 15m dish S-Band antenna.

OR4ESA is the temporary special callsign for the activation at the
European Space Agency (ESA) - Redu Site and Satellite Tracking Station
in Redu, Belgium. (Grid locator: JO20na)

Javier will try to be on the air daily (Monday to Friday) in the evening
after work approximately 18:00 - 21:00 UTC both in SSB and in digital

modes. Digital modes will be mainly PSK31 and RTTY as QRP.

The contacts are valid for the ESA Amateur Radio Award (2 points per first QSO per mode and band).

All the QSOs will be uploaded to LoTW, eQSL, Clublog, HRDLog and QRZ.com. He prefers electronic QSLs as they are faster, cheaper, easier to archive and they are more friendly to the environment. Paper QSLs should be sent via bureau or direct to DL0ESA. Please include SASE and $1 USD Europe, $2 USD outside Europe. Paper QSLs will only be sent in reply to the ones received.

All details of the activation can be found in www.qrz.com/db/OR4ESA

[ANS thanks Javier Roldan, EA1HEO and OR4ESA for the above information]

ESA Announces Winners Cubesat to the Moon Competition

The European Space Agency has announced two cubesat project teams as winners of a competition to send cubesats to the moon.

+ The Lunar Meteoroid Impact Orbiter, or Lumio for short, would circle over the far side of the Moon to detect bright impact flashes during the lunar night, mapping meteoroid bombardments as they occur.

+ The other, the Lunar Volatile and Mineralogy Mapping Orbiter, or VMMO, would focus on a permanently shadowed crater near the lunar south pole, searching out deposits of water ice and other volatiles of interest to future colonists, while also measuring lunar radiation.

The impact-tracking Lumio is a single 12-unit CubeSat, conceived by a consortium including Politecnico di Milano; TU Delft, EPFL, S[&]T Norway, Leonardo-Finnmeccanica and the University of Arizona.

VMMO, developed by MPB Communications Inc, Surrey Space Centre, University of Winnipeg and Lens R&D, also adopts a 12-unit CubeSat design. Its miniaturised laser would probe its primary target of Shackleton Crater, adjacent to the South Pole, for measuring the abundance of water ice. The region inside the crater is in permanent darkness, allowing water molecules to condense and freeze there in the very cold conditions.

No amateur radio content has been announced for these missions. The ESA said the idea behind our lunar CubeSat competition was challenging - up until now CubeSats have operated solely within Earth orbit. However, opportunities should open up to piggyback to the Moon in the coming decade, with circumlunar flights of the NASA-ESA Orion spacecraft and planned commercial flights.

The ESA announcement can be accessed on-line at:
http://tinyurl.com/ANS-028-ESA-CubesatMoon (www.esa.int)

[ANS thanks the European Space Agency for the above information]

Satellite Shorts From All Over

+ On Jan. 31, the Super Blue Blood Moon Eclipse will be visible before sunrise in North America, Alaska and Hawaii.
http://tinyurl.com/ANS-028-LunarEclipse (space.com)

+ Michelle Thompson, W5NYV, posted the January 19 video Phase 4 Ground Weekly Status report at:
Part 1 - https://youtu.be/eD5P4tHIb9w
Part 2 - https://youtu.be/gY0IQsppSI4
Her reports cover the IEEE Radio and Wireless Week, held in Anaheim, California from 14 - 17 January 2017. RWW is an annual technical conference from IEEE, and is sponsored primarily by Microwave Theory and Techniques Society. It consists of five different co-located topical conferences. One of those conferences was the Topical Workshop on The Internet of Space or TWIoS, with two sessions. There was also a CubeSat workshop!

+ The Humanity Star was carried to orbit on-board the Rocket Lab launch from New Zealand. Their website advises, "Visible from space with the naked eye, the Humanity Star is a highly reflective satellite that blinks brightly across the night sky to create a shared experience for everyone on the planet. Created by Rocket Lab founder and CEO Peter Beck, the Humanity Star is a geodesic sphere made from carbon fibre with 65 highly reflective panels. It spins rapidly, reflecting the sun’s rays back to Earth, creating a flashing light that can be seen against a backdrop of stars." More information and a tracking map (showing when it is visible and when it is in eclipse) is posted on the project's website:
http://www.thehumanitystar.com/

+ Watch this video as KD2AVU worked KC8QDQ in EM89 on FO29. He doesn't have elevation rotor so best chance for him to work the bird is when it's on the low angle. Antenna: 2m beam (TX) homebrew DK7ZB 5 element 70cm beam (RX) stacked homebrew 10 element. Transceiver: Yaesu FT-847 TX power: 25W. Both antennas are in the attic! Watch on-line at:
https://www.youtube.com/watch?v=ifpZMkACNNw

+ A frequently asked question during these good times of new satellite launches involves how to update the Keplerian Elements as orbits are identified or new satellites are launched. AMSAT-UK has a nice resource, "Adding new satellites to #SatPC32, Gpredict and Nova", see:
https://amsat-uk.org/2013/11/23/adding-new-satellites-to-satpc32/

+ On January 18, Thursday night at 9 pm Eastern time, Jerry Buxton, N0JY the vice president for engineering at AMSAT was interview on the HamTalkLive webcast to talk about the process of building amateur radio satellites, and the latest on the newest bird, Fox-1D. You can listen on demand 24/7/365.25 at:
https://www.spreaker.com/show/ham-talk-live - select episode #98.

+ Enjoy the satellite presentation by Doug Tabor, N6UA, during his talk at the 2018 Winter Hamfest hosted by Northern Colorado Amateur Radio Club:
https://www.youtube.com/watch?v=FJoh7g8BWok&feature=youtu.be

+ Are any of you interested in pursuing a PhD-degree, within space radio systems (software defined radio) or integrated operations involving small satellites and other autonomous vehicles? We are seeking two new PhD-candidates to join our small satellite team, at Norwegian University of Science and Technology in Trondheim, Norway. Full text and how to apply:
http://tinyurl.com/ANS-028-UnivNorwaySmallSat
More information about our team and on-going missions can be found here: https://www.ntnu.edu/ie/smallsat (via cubesat e-mail list)

+ Rocket Lab conducted its second Electron launch on January 21 placing three cubesats into orbit. The launch occurred from the remote Mahia Peninsula in New Zealand. Mission control is located

in Auckland, New Zealand. On board was a Planetlab cubesat named Dove Pioneer which will conduct Earth resource imaging and two Lemur-2 cubesats for Spire which will be used for weather and ship tracking. Full report and video posted at: http://tinyurl.com/ANS-028-RocketLabsLaunch

+ NASA released this new video on January 11, 2018, which was created by astronomers and visualization specialists from its Universe of Learning program. These experts have combined visible and infrared images from the Hubble and Spitzer space telescopes to create a three-dimensional, fly-through view of the Orion Nebula, a fuzzy patch in your sky tonight, really a place where new stars are forming:
http://earthsky.org/space/video-visualization-3d-orion-nebula-nasa

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In addition to regular membership, AMSAT offers membership in the President's Club. Members of the President's Club, as sustaining donors to AMSAT Project Funds, will be eligible to receive additional benefits. Application forms are available from the AMSAT Office.

Primary and secondary school students are eligible for membership at one-half the standard yearly rate. Post-secondary school students enrolled in at least half time status shall be eligible for the student rate for a maximum of 6 post-secondary years in this status. Contact Martha at the AMSAT Office for additional student membership information.

73 and Happy New Year,
This week's ANS Editor,
JoAnne Maenpaa, K9JKM
k9jkm at amsat dot org